

NQE 211 Engineering Mathematics for Nuclear Engineers

Summer 2017

- **Instructor:** Young-chul Ghim
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 - Office hours: TBA
 - TA: TBA
- **Lecture Hours:** Mo. Tu. We. Th. 1:00pm – 3:45pm (1:00 – 2:15pm, 2:30 – 3:45pm)
- **Classroom:** TBA
- **Online Lecture:** This course is **Education 3.0** class. Therefore, you are required to listen the online lectures before the class.
- **In-class lectures:** Discussion based on the online lectures, take quiz and do homework
- **Language:** Lectures, discussion, homework and exams will be conducted in English
- **Grading:** Quiz (20%), Self-learning (20%), Team project (10%), Midterm (25%), Final (25%)
 - ✓ Quiz: 5-10 minute in-class quiz (every class) based on the online lectures (you are highly recommended to listen the online lectures before coming to lectures so that you get good credit for quiz)
 - ✓ Self-learning: almost every week (approximately two problems)
 - ✓ Team project: There is one team project. You will need to identify, define and solve the problem using the Laplace-Fourier transform technique. (Team leader: full score. Team members: +/-5 points of separation distance among members with the given average score.)
 - ✓ Midterm: in class
 - ✓ Final: in class
 - ✓ Bonus point: If you find any mistakes from online lectures, then you will get extra one point (out of 100 points) for your midterm or final for each mistake you find.
- **Textbook:** P. V. O’Neil “Advanced Engineering Mathematics” 7th. Ed.
 - ❖ Other potentially useful book:
 - Kreyszig, “Advanced Engineering Mathematics.”
 - C. R. Wylie and L. C. Barrett, “Advanced Engineering Mathematics.”
- **Prerequisites**
 - ❖ Knowledge of basic calculus

• **Course schedule** (This plan is subject to slight modification in topics and orders.)

Date	Lecture #	Topics	Online lecture #	Self-learning	Reading
July. 3	1	First order Ordinary Differential Equation (ODE's)	5 clips (68 min.)		Ch.1
	2	First order Ordinary Differential Equation (ODE's)	5 clips (75 min.) 1 summary clip (10 min.)		Ch.1
July. 4	3	Second order ODE's	5 clips (107 min.)	#1	Ch.2
	4	Second order ODE's	4 clips (70 min.) 1 summary clip (18 min.)	#1	Ch.2
July. 5	5	Laplace Transforms	5 clips (106 minutes)	#1 Due, #2	Ch.3
	6	Laplace Transforms	4 clips (86 min.) 1 summary clip (8 min.)	#2	Ch.3
July. 6	7	Series solutions, singular points	4 clips (80 minutes)	#2 Due, #3	Ch.4
	8	Series solutions, singular points	3 clips (66 min.) 1 summary clip (16 min.)	#3	Ch.4
July. 10	9	Complex numbers, complex functions	7 clips (145 min.)	#3 Due, #4	Ch.19
	10	Complex integration	5 clips (111 min.)	#4	Ch.20
July. 11	11	Series representation in complex plane	4 clips (62 min.)	#4 Due, #5	Ch.21
	12	Theory of residues	4 clips (90 min.)	#5	Ch.22
July. 12	13	Inverse Laplace Transform	4 clips (89 min.) 4 summary clips (40 min.)	#5 Due, #6	Ch.22
		Midterm preparation			
July. 13		Midterm (75 min. in class)			
	14	Fourier series	4 clips (90 min.)	#6	Ch.13
July. 17	15	Fourier series	3 clips (46 min.)	#6 Due, #7	Ch.13
	16	Fourier transforms, Inverse Fourier transforms	3 clips (85 min.)	#7	Ch.14
July. 18	17	Fourier transforms, Inverse Fourier transforms	4 clips (82 min.)	#7 Due, #8	Ch.14
	18	Laplace Fourier transforms	3 clips (64 min.) 1 summary clip (8 min.)	#8	Ch.14
July. 19	19	Vector spaces	4 clips (81 min.)	#8 Due, #9	Ch.6
	20	Matrices and linear algebra	5 clips (89 min.)	#9	Ch.7
July. 20	21	Determinants	4 clips (57 min.)	#9 Due, #10	Ch.8
	22	Eigenvalue problems	3 clips (50 min.)	#10	Ch.9
July. 24	23	Team project presentation	None		
	24	Team project presentation	None		
July. 25	25	Eigenvalue problems	4 clips (74 min.)	#10 Due, #11	Ch.9
	26	System of differential equations	4 clips (81 min.)	#11	Ch.10
July. 26	27	System of differential equations		#11 Due	Ch.10
		Final preparation			
July. 27		Final (3 hours in class)			